REMARKS/ARGUMENTS

Pending Claims

Claims 6, 8, 9 and 10 are pending in this application. Claims 1 and 2 (directed to a data packet), and independent claim 7 (directed to a distributed network) have been cancelled without prejudice. Independent claim 6 (directed to a method of responding to an information request) and independent claim 9 (directed to a system for responding to an information request) have been amended to further distinguish their subject matter more clearly from the prior art, and particularly the Hart reference. Dependent claim 8 has been amended to depend from independent claim 7. New dependent claim 10 is dependent from independent claim 9, and corresponds in subject matter to dependent claim 8.

Rejections Under 35 U.S.C. § 102(b)

The Advisory Action mailed December 21, 2005 rejected claims 1, 2 and 6 to 9 under 35 U.S.C. § 102(b) as being anticipated by Hart (U.S. Patent No. 5862344). The Advisory Action asserts that the remarks and amendments of the Reply filed December 2, 2005 were considered, but found unpersuasive.

Summary of Advisory Action

The Examiner's comments in the advisory action are appreciated. In the advisory action it is explained that the processing referred to by Hart in column 3 at lines 20 to 29 is considered to correspond to the processing claimed in now cancelled claim 1, especially if it is considered that Hart discloses enveloping means as referred to by Hart in column 7 at lines 11 to 24.

Column 3, lines 21-29 of Hart specifies as follows:

Broadly the present invention is directed to apparatus and methods which provide processing system network connectivity, and more particularly, which enable data packets to be routed through a processing system network. The processing system network includes a plurality of sub-processing system networks (also called "sub-networks") wherein each sub-network is either a LAN or a WAN and includes at least one node. Each node may either be a processing system or another sub-network.

The passage of Hart referred to by the Examiner in column 7, lines 11-24, specifies as follows:

> *Routers often add additional information in order to route the data packet through the network. For example, a router might wrap an Ethernet data packet in an "envelope" of data containing routing and transmission information for transmission through an X.25 packet-switched network. When the data envelope passes through the X.25 network, a receiving router strips off the X.25 data, readdresses the Ethernet data packet, and sequences it on its attached LAN segment. Routers may choose from redundant paths between networked segments or may link networked segments using very different data packaging and media accessing schemes.*

Further, in the advisory action the claim limitation that the processing node determines the routing information contained in the further layer in dependence upon only the data packet content is discussed. The Examiner explains that he considers the Hart reference to disclose this feature, not by the discussion of the MCAM, but by referring to a router to route data packets in column 7 at lines 11 to 24.

Summary of Problem Addressed by Hart

The Hart reference explains how delays in packet routing are caused by unnecessary "wrapping" of data packets, and seeks to reduce such delays when this "wrapping" is unnecessary, as described in column 2 at line 57 to column 3 at line 18, where it is stated:

> *"Thus, although the foregoing process is both necessary and effective for processing a data packet routed to the WAN, it is equally unnecessary and ineffective when routing a data packet between LAN nodes. In point of fact the search and retrieval processes performed by the control circuitry when transferring a data packet from one locally connected LAN to another cause significant delays. The delay is compounded by the determination as to whether the data packet requires additional processing. These delays are compounded still further when considering that the portal device may, and often does, receive hundreds, if not thousands, of data packets per second. Many, if not most, of these data packets are queued and routed on a first come, first serve basis. A LAN -to- LAN data packet that is preceded by several data packets requiring*

special processing typically is required to wait unnecessarily. This wait curtails portal device throughput and the overall functionality of the processing system network.

Accordingly, there exists a need in the art to substantially eliminate delays associated with routing a data packet between two nodes wherein the data packet requires little or no additional processing.

There exists a further need to substantially eliminate delays associated with routing a data packet from a source LAN to a destination LAN.

There exists a still further need to reduce over-all memory access time associated with searching and retrieving addressing data from the memory of a portal device."

The delay, Hart explains, occurs when data packets are wrapped with routing information, which, while it serves a useful purpose in routing LAN packets across WANs (i.e. Ethernet packets across the Internet of 1995), is superfluous when routing LAN-LAN.

To reduce these delays Hart proposes an arrangement where a centralized Multiple Communications Adapter Module (MCAM) 100 contains a first memory 503 and a second memory 504. The first memory 503 stores addressing data for routing data packets from a source network to one or more destination networks. The second memory 504 stores addressing data for routing data packets between particular selected ones of the source and destination networks. The second memory 504 is a high-speed buffer storage that is continuously updated to contain the most recently addressed contents of the first memory 503 (which is the main memory). The second memory 504 is provided to speed access to frequently used addressing data.

Distinctive Features of the Present Invention

The Examiner is respectfully first asked to consider the limitation present in independent claims 6 and 9 which specify that "said first processing node determining the routing information contained in the routing layer in dependence upon only the request object content". In the arrangement described by Hart, when a data packet is required to be routed to the second sub-network, the MCAM 100 interrogates the first and second memories 503 and 504, which return the address of the node of the second sub-network to which the data packet should be routed. The routing of the data packets is controlled by the centralized MCAM 100. There must

be an entry in the first memory 503 (and sometimes also in the second memory 504) indicating the current address and the final destination address of the relevant data packet. Clearly, the routing performed by the MCAM uses information not present in the data packet, in contrast to the presently claimed invention. As discussed in the present application, maintaining such a database requires a considerable amount of effort - especially when many data packets are being transmitted simultaneously.

Our understanding is that the Examiner considers the disclosure in relation to routers by Hart in column 7 at lines 11 to 24 suggests an alternative way of routing data packets. What Hart describes here is a conventional router. A conventional router is defined, for example, in the Free On-Line Dictionary Of Computing as being:

> *A device which forwards packets between networks. The forwarding decision is based on network layer information and routing tables, often constructed by routing protocols.*

The reference to "routing tables" is significant. As routing tables are used, it is clear that data packets are routed using information outside the data packet, in contrast to the presently claimed invention where the routing information is determined in dependence upon only the request object content.

The passage of Hart in column 7 referred to by the Examiner explains that routers "often add additional information in order to route the data packet through the network", that the router "strips off the X.25 data, readdresses the Ethernet data packet...". However, there is no disclosure by this text (either implicit or explicit) of the routing data being determined in dependence upon only the data packet content. This is simply not disclosed by this passage. In fact, a person skilled in the art, with knowledge of the function of the router, as illustrated above by the dictionary definition provided, would understand that the passage in column 7 of Hart refers to a router that makes reference to a routing table in order to perform routing. Clearly, such routing is not determined <u>in dependence upon only</u> the data packet content.

Thus, there is a clear distinction between the presently claimed invention and the Hart reference. The present invention is fundamentally different to the arrangement disclosed by Hart.

To further emphasise the fundamental differences between the present invention and the Hart reference, claim 1 has been amended to refer to a data <u>object</u> rather than a data "packet". The term "object" is used in the application as originally filed, for example, on page 6 at line 18

and throughout pages 12 and 13. The use of the term "object" emphasises the self-contained nature of the presently claimed request object. The request object is produced by receiving an information request from a client device and wrapping information request in at least one layer. Thus, it should be understood that the request object is self contained and includes comprehensible information request. It is not a data packet of the type described by Hart, such a data packet being one of a multiplicity of data packets that might, together, form a comprehensible and self-contained information item.

Independent claims 6 and 9 explain how the request object is transmitted over a distributed network comprising a plurality of processing nodes. The first processing node performs analysis of the information request stored on the request object to determine whether the first processing node is able to process the information request and generate at least part of response data which is responsive to the information request. Further, as discussed above, the first processing node adds a routing layer to the request object (which routing information is determined in dependence upon only the data object content). A second processing node also performs analysis of the information request stored on the request object to determine whether the second processing node is able to process the information request and generate response data which is responsive to said information request. The first processing node adds the routing layer to the data packet whilst leaving the said at least one layer of the request object intact and undisturbed.

At least one of the first and second processing nodes, the information request in the request object is processed and at least part of response data which is responsive to the information request is generated. The response data is added to the request object.

From the explanation thus far, the further differences between the present invention and the Hart reference should be clear: the present invention allows a request object to be formed that includes an information request from a client device. The request object is self-contained and comprehensible, in itself, to a processing node. The processing node is able to analyse the information request in the request object to determine whether it is able to process the information request and generate response data which is responsive to the information request. If the processing node is able to process the information request it generates the response data responsive to the information request and adds the response data to the request object. Such an arrangement is simply not disclosed or suggested at all by Hart. The only "processing" disclosed by Hart is the adding or stripping away of destination information of a data packet (not an

object), which allows routing of the data packet. There is no disclosure of a client device which produces an information request. There is no disclosure of wrapping information request in at least one layer to produce a request object. It is therefore not possible for the arrangement disclosed by Hart to generate response data which is responsive to an information request from a client device. Further, clearly such response data is not added to the request object.

The presently claimed invention is even further distinguished from the Hart reference in specifying that the request object, including the response data, is transmitted back to the client device via the distributed network for responding to the information request, and which request object includes the information request.

Even if the router disclosed by Hart could be considered to be a "processing node", there is clearly no disclosure of the router performing the claimed "analysis of the information request stored on the request object to determine whether the first processing node is able to process the information request and generate at least part of response data which is responsive to said information request" because there is no information request, received from a client device, disclosed by Hart.

Summary

In summary, in contrast to the arrangement for simply routing a data packet disclosed by Hart, the present invention is concerned with the distributed processing of request objects to respond to an information request on the data packet obtained from a client device. The routing of the request objects is performed in dependence only upon the content of the request object. No central store of addressing data is required.

As recited in the independent claims, first and second processing nodes are provided. The request object holding the information request is analysed by the first processing node (and second processing node) to determine whether that processing node is able to process the information request or not. No such analysis of the client device information request in a request object and determining of whether processing of the information request is possible is disclosed or suggested by Hart. Nor does Hart disclose onward routing of the request object based only on the content of the request object. Even less does Hart teach transmitting back to the client device the request object including response data generated by a processing node and for responding to an information request. Hart refers to the ability of a router to add additional information to a data packet solely to route the data packet through a network. Further, in the

embodiment Hart describes this information is obtained from the central MCAM 100 with reference to the first and/or memories 503 and 504. The description of a router in column 7 of Hart also implicitly requires access to a routing table to route the data packets of Hart. In contrast, in the present application, the routing information that the first processing node provides in the further layer added to the request object is determined by the first processing node in dependence upon the request object content only. No reference is made to a centralised database for routing information. The present invention specifically seeks to avoid this. When processing of the information request has been completed by as many processing nodes as is necessary, response data is generated and held by the request object for use by the originator of the data packet (the client).

In accordance with the present invention, the request objects are essentially self-contained and can be passed from one processing node to another processing node. There is no need to construct and manage a complex database of address data of various information requests submitted by clients. The routing of the request object from one processing node to another processing node is determined by the sending processing node in dependence upon the data request object only.

In this way, the present invention provides an arrangement in which an information request is evaluated by each processing node to determine whether that processing node can process the information request (either wholly or partially). Each node, in addition to adding routing information, may add to the request object information generated as a result of the processing of the request object by the node. This added information may be used by subsequent processing nodes to assist in generating the response data.

Although in the present invention the client specifies the information request and may specify the location of the first processing node, thereafter the routing and the processing of the information request in the request object are determined by the first processing node and subsequent processing nodes. The need to maintain a centralised database such as the MCAM 100 (or routing table) in Hart is avoided. This makes the arrangement of the present invention highly scaleable.

Conclusion

For the foregoing reasons, the application claims are considered to be in good form for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the

prosecution of the subject application, the Examiner is invited to call the undersigned attorney. Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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